DATE: December 7, 2011

TO: Whom It May Concern/ US Fish and Wildlife Service

RE: NiSource Draft Environmental Impact Statement and Draft Habitat Protection Plan

I write this letter from the perspective of an expert on the bog turtle (*Glyptemys = Clemmys muhlenbergii*). I have been engaged in research on bog turtles for over 25 years and have published peer reviewed articles and many technical reports regarding their biology and ecology (See attached CV). I have also been the Principal Investigator on numerous grants from various state and federal agencies (e.g., US Fish and Wildlife Service, the NYS Department of Environmental Conservation and the Biodiversity Research Institute of the State of New York) focused on bog turtles. My current position is Professor of Biological Sciences at the State University of New York @ Oswego (SUNY-Oswego) where I have been a faculty member since 1985.

It is from this perspective that I express my opposition to the proposed incidental take permits (both 10 and 50 year) being requested by NiSource from the US Fish and Wildlife Service (Service) with respect to the bog turtle as part of its Draft Environmental Impact Statement (DEIS) and Draft Habitat Conservation Plan (DHCP) submitted to the Service. **Instead, I believe that the option of a NO ACTION/case-by-case evaluation is the preferred action needed by the Service in order to assure that proper measures and consideration be given to each proposed action that NiSource might want to undertake with regard to potential or actual take of bog turtles.**

There are any number of reasons why both the 10 and 50-years options are inappropriate. Paramount is the reality that situations change. Both the 10 and 50-year time intervals are far too great a time period for NiSource to be able to hold permits to take any federally (and state) protected species. Conditions change as we all know and as situations change, there needs to be an opportunity for those responsible for regulating the laws of the United States to take appropriate actions. Just consider the changes in our world that have occurred in the last 50 (or 10) years. The situation on the ground is in a constant state of flux and the Service needs to be able to respond to the changing world with respect to its duty to administer the Endangered Species Act (ESA).

Furthermore, the proposed mitigation (6.2.2.6 Compensatory Mitigation) is not realistic. NiSource plans to conduct " vegetation removal, grading, and trenching of the site" during its initial construction phase. Bog turtle habitat is floristically (vegetatively) and hydrologically unique and cannot be restored in the manner suggested by NiSource once the habitat has had vegetation removed, the ground graded and the water diverted via trenching. NiSource claims that it can re-create suitable fen habitat for bog turtles. This is a fantasy. One of the main reasons why bog turtles are rare is that their habitat is rare. Their complex wetland habitat parameters cannot simply be restored once they have been damaged or destroyed. Bog turtles are habitat specialists and as such, they live in highly specialized habitats that cannot just be created once they have been damaged or destroyed. It is not as simple as other wetland mitigation projects because the fen habitat that the bog turtle inhabits is not your typical wetlands restoration program. To the best

of my knowledge, it is not possible for humans to make bog turtle habitat where it has not existed beforehand.

Should any permitting for incidental take occur, I would recommend that rather than attempting to restore or make bog turtle habitat, that NiSource, in consultation with the Service, endeavor to acquire, through purchase, known bog turtle habitat with viable bog turtle populations on them that are currently in private ownership and transfer those lands to an entity such as a land trust that is capable of managing those sites. We have done comparable mitigations with the Army Corp of Engineers in New York State. While this approach is not ideal, it is a more reasonable approach to mitigation than the notion that the highly specialized habitat of the bog turtle can be created *de novo*. It is also an easier fix for NiSource in that they only need to write a check and better for the bog turtle because actual (real) bog turtle habitat is preserved.

With respect to the articles of mine that are cited in the DHCP (p. 78 and 79), I feel in both instances, NiSource mis-represents the issues and data I have presented in peer reviewed publications. Specifically, in regard to the population sizes mentioned in Rosenbaum and Nelson 2010 (Northeastern Naturalist Vol. 10 No. 3 pp. 415-437), the DHCP suggests that because these populations are in the Prairie Peninsula Lake Plains Recovery Unit (PPLPRU), they are not representative of bog turtle populations elsewhere. I am not sure why this would be true and NiSource make no claim to back up their statement except to say that the PPLPRU is an outlier and as such does is not representative of other Recovery Units.

Additionally, NiSource erroneously claims that bog turtle populations of 10-30 turtles can withstand impact of the loss of 4-13 individuals and still survive. In my professional view, this is utter nonsense. Killing half or more of the bog turtle population would lead to the local extirpation of that population. There is no reason to suggest any other possibility. Bog turtles have a low reproductive potential and are very long-lived such that each individual is a critical member of that breeding group. The likelihood that any bog turtle population could withstand that sort of incidental take pressure is slim to nil. Hence, I would suggest that we assume that NiSource will exterminate the bog turtle populations they encounter and address this reality upfront and without invoking some fantasy notion of population replacement.

In the area where I work most closely, the Prairie Peninsula Lake Plains Recovery Unit, there are only 5 known extant bog turtle sites/populations. The Bog Turtle Recovery Plan calls for the protection and preservation of at least 10 bog turtle sites in this recovery unit. Any harm or incidental take that might occur at any of these 5 sites would further reduce the chance of recovery for the bog turtle in this recovery unit. While I am aware of the fact that NiSource does not **currently** plan on conducting work in the PPLPRU, I strongly suspect that incidental take leading to local extirpation in other regions would dramatically impact the possibility of recovering this species and reaching the goals set forth in the Bog Turtle Recovery Plan. As noted above, impact by NiSource strongly suggest local extirpation at those impacted sites.

With respect to my 2007 genetics paper (Rosenbaum et al 2007. Conservation Genetics Vol. 8. No. 4 pp, 331-342) NiSource suggests that because we found low genetic

diversity in mitochondrial DNA loci, "that any losses of turtles from individual sites are unlikely to result in significant changes to the species genetic diversity" (DHCP, 2011). This is a misinterpretation of our data. The reason for low mitochondrial DNA diversity is unknown and may be a function of stochastic factors that occurred during the course of bog turtle's evolution. In our paper, we suggest two possible reasons for low mitochondrial DNA diversity: a possible historical genetic bottleneck and a possible instance of selective sweep, in which certain genes not associated with the traits being selected for were eliminated due to the effects of some historic environmental factor. Indeed, the two hypotheses are not mutually exclusive. Further we argue that maintaining the bog turtle populations that exist today are the most important conservation modalities possible in order to preserve the long-term integrity of this species. Specifically, we argue that "Due to anthropogenic landscape changes, the loss of fens and bogs in the last century far exceeds the creation of novel, suitable habitat patches (Herman 1989; Tryon and Herman 1990; Klemens 1990, 2000). Fragmentation of bog turtle habitat will further limit gene flow among remaining sub-populations, preventing the exchange of genetic diversity in this species. ***However, low genetic diversity seems to be a historical characteristic of this species, therefore, the lack of genetic variability is not likely the largest threat to the persistence of bog turtles***. ***Preservation of extant habitats supporting populations with sustainable levels of recruitment and the restoration or creation of habitats in areas occupied historically are likely the most important measure necessary for conservation of this species."(Emphasis added) (Rosenbaum et. al, 2007).***

Additionally, mitochondrial DNA is but one of numerous genetic systems in an organism and low genetic variability in one system does not mean that extirpation of specific populations would not result in significant changes to the genetic diversity for this species. Indeed, in other genetic systems (e.g. microsatellite DNA), King and Julian (2004) (King, pers. comm.) have identified a suite of microsatellite loci with large amounts of genetic diversity in bog turtles. Specifically, King is able to use multisource microsatellites to identify individual bog turtles to their drainage and in most cases to their specific site with a very high degree of accuracy. This argues for significant site specific DNA in particular bog turtle populations, rather than the assertions made by NiSource in its DHCP.

Furthermore, besides mitochondrial and microsatellite DNA, there are coding sequences of nuclear DNA, which is likely the most important type of DNA for any species. This is the DNA that resides in the nucleus of all cells in an organism and codes for proteins. NiSource makes no claim to know what damage will be done to the genetic diversity of coding nuclear DNA in the bog turtle populations they will likely eliminate in the course of their pipeline installation. With the above in mind, I suggest that the destruction of 23 bog turtle sites/populations will most likely have significant impacts on the genetic diversity of the bog turtle. It may also disrupt connectivity between bog turtle populations which is known to be a very important factor in maintaining long term viability of bog turtle populations (Shoemaker and Gibbs, in press; K. Shoemaker, pers. comm.).

The goals of the Bog Turtle Recovery Plan (2001) and the Endangered Species Act (1973) (ESA) are not compatible with the concept of incidental takes that permitted on either a 10 or 50-year permit. Instead, a review is needed on a case-by-case, site-by-site basis for each instance where NiSource will impact a bog turtle population. The ESA and the Bog Turtle Recovery Plan (2001) requires that incidental takes, when permitted, be addressed on a site-by-site, case-by-case standpoint. Why then, would it be reasonable to issue a blanket permit to NiSource to take bog turtles wherever and whenever it pleases FOR 50 YEARS? ***With all due respect to all parties involved, it is inconceivable to me to think that NiSource would apply for such a 50-year blanket permit and even more inconceivable that the Service would grant such a permit.*** A blanket permit would not allow the Service or any State of Federal agency the latitude it needs to apply the goals of the Recovery Plan or the ESA to a particular site or situation for what is, for all intensive purposes, in perpetuity. Half a century is an incredibly long period of time as witnessed by the changes that have occurred in the last 50 years. The next 50 years is likely to be associated with an even greater amount of change than the previous half-century. Even a 5 or 10-year permit would be too long for the Service to properly administer the ESA.

The ESA is designed to permit activities that are necessary but it is not designed to allow for any company to get a free pass to take a protected species whenever and wherever they want, especially not when the time interval requested is 1-5 decades. With all due respect to all parties concerned, this proposed (10 and) 50 year blanket permit is absurd in the extreme!

I would argue that a blanket permit does not serve the People of the United States who have charged the Service with protecting its biota. Specifically, each bog turtle population (site) has its own unique status and priority as it relates to the goals of the recovery of this species. There should be a detailed evaluation of the consequences of any incidental takes based on the site-specific issues involved.

In summary, it is clear to me that the goals of the Bog Turtle Recovery Plan and the ESA will be severely imperiled by any incidental take permitting that is not addressed on a case-by-case, site by site basis. Should the Service allow any other permitting, I believe that it would be in direct contradiction to the goals, objective and purpose of the Bog Turtle Recovery Plan and the Endangered Species Act.

Thank you for the opportunity to comment on this matter.

Yours truly,

Peter A. Rosenbaum, Ph.D.

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attachment:

Abridged Curriculum Vitae Peter A. Rosenbaum, Ph.D.

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Education:

Institution	Area of Study	Dates	Degree
Tulane University (T.U.) College of Arts & Sciences New Orleans, LA.	Biology	1970-1974	B.S.
Tulane University Graduate School	Biology (Animal Behavior)	1974-1976	M.S.
Tulane University Graduate School	Biology (Genetics)	1976-1981	Ph.D.
Louisiana State University Medical Center (LSUMC) Specialized Center of Research-Arteriosclerosis (SCOR-A)	Genetic Determinants of Heart Disease	1980-1982	Post-Doctorate (NIH)

Recent Awards

"*Conservation Hero Award*" New York Field Office of the United States Fish and Wildlife Service. "In recognition of your efforts toward the conservation and recovery of the federally threatened bog turtle. Your continued energy and enthusiasm have led to multiple accomplishments for this species and the Service truly appreciates your ongoing work". June, 2004.

Recent Academic Affiliations

2001-present	SUNY-Oswego Department of Biological Sciences	Professor
2001-2002	Cornell University Department of Ecology and Evolutionary Biology	Visiting Professor
1991-2000	SUNY-Oswego Biology Department	Associate Professor
1985-1991	State University of New York-Oswego (SUNY-Oswego) Biology Department	Assistant Professor

Recent Professional Experiences

2001-present	Steward. Central New York Land Trust, Inc.
1999-2009	Great Lakes Research Consortium Task Force. "Status and ecological roles amphibians and reptiles in the Lake Ontario / St. Lawrence River basin. Member.
1999-present	Oswego County Environmental Management Council. Member
1992-present	Small Grant Committee. Rice Creek Associates. Chair
1986-present	Board of Directors, Rice Creek Associates. President 1998-2000; Vice President; 1988-1991 & 2000-present.

Recent Peer Reviewed Articles

Pagano, J.J, Rosenbaum, P.A., Roberts, R.N., Sumner, G.M., and Williamson, L.V. " Qualitative

and quantitative assessment of maternal contaminant burden by analysis of snapping turtle eggs". Journal of Great Lakes Research. Vol. 25. No. 4. pp. 950-961 (1999).

Rosenbaum, P.A. J. M. Robertson, K. R. Zamudio "Unexpectedly low genetic variation among populations of the bog turtle (*Glyptemys muhlenbergii*) ".Conservation Genetics. Vol. 8 No. 4 pp. 331-342 (2007).

Rosenbaum, P.A. and A.P. Nelson. "Bog Turtle Habitat on the Lake Ontario Coastal Plains. Northeastern Naturalist. Vol.17 No. 3 pp 415-436 (2010).

Recent Books

Rosenbaum, P.A. Student Study Guide for Biology and Human Concerns 4e by E. Peter Volpe. Wm. C. Brown Co. Dubuque, Iowa. (1993).

Volpe, E.P and Rosenbaum, P.A. Understanding Evolution 6e. McGraw Hill / Wm. C. Brown Co. Dubuque, Iowa. (2000).

Rosenbaum, P.A. Volpe's Understanding Evolution. 7e. McGraw Hill. (2010)

Recent Research Reports

Nelson, A.P and P.A. Rosenbaum "1997 Bog Turtle Surveys & Preliminary Floristic Evaluation of Selected Sites in Western & Central New York Counties" Biology Department, SUNY-Oswego. Research Report prepared for the Endangered Species Unit, Bureau of Wildlife, Division of Fish and Wildlife, NYS Department of Environmental Conservation. Feb., 1998).

Rosenbaum, P.A. and A. P Nelson (1998) 1998 Progress Report: Bog Turtle Habitat Assessment of Central NYS Peatlands. Prepared for the U.S. Fish and Wildlife Service. Nov., 1998.

Rosenbaum, P.A. (1999) "Field Studies of Bog Turtles in Oswego and Seneca Counties: 1998 Summary". Prepared for the NYS Department of Environmental Conservation. Endangered Species Office. February, 1999.

Rosenbaum, P.A. and A. P Nelson (1999) "1999 Progress Report: Bog Turtle Habitat Assessment of Oswego County New York--Year 2". Prepared for the U.S. Fish and Wildlife Service. December, 1999.

Rosenbaum, P.A. (2000) "Field Studies of Bog Turtle Sites in Oswego and Seneca Counties: 1999 Summary". Prepared for the NYS Department of Environmental Conservation. Endangered Species Office. January, 2000.

Rosenbaum, P.A. and A. P Nelson (2000a) "2000 Progress Report: Bog Turtle Habitat Assessment of Oswego County New York--Year 3". Prepared for the U.S. Fish and Wildlife Service. November, 2000.

Recent Research Reports continued

Rosenbaum, P.A. and A. P Nelson (2000b) "Trapping to Establish the Presence of Bog Turtle Populations at Selected Sites in Oswego County - 2000 Field Season". Prepared for the

U.S. Fish and Wildlife Service. November, 2000.

Rosenbaum, P.A. (2001) "Field Studies of Bog Turtle Sites in Oswego & Seneca Counties: 2000 Summary". Prepared for the NYS Department of Environmental Conservation. Endangered Species Office. January, 2001.

Rosenbaum, P.A. (2002) Bog Turtles of the Prairie Peninsula/Lake Plains Recovery Unit: 2001 Field Studies of Bog Turtles (*Clemmys muhlenbergii*) in Western and Central New York State Prepared for the NYS Department of Environmental Conservation. Endangered Species Office. February, 2002.

Rosenbaum, P.A. (2003) Ecological, Demographic and Genetic Studies of Bog Turtles in the Prairie Peninsula/ Lake Plain Recovery Unit: 2002 Field Studies in Oswego. County. Prepared for the NYS Department of Environmental Conservation. Endangered Species Office. January, 2003.

Rosenbaum, P.A. (2005) "Survey for Bog Turtles (Clemmys = Glyptemys muhlenbergii) at Sloperville Bog (OR-29) In Oswego County New York, 2004". Prepared for the Nature Conservancy/New York Natural Heritage Program. Albany, New York.

Rosenbaum, P.A. (2005) "Ascertainment of Bog Turtles Sites in the Prairie Peninsula/Lake Plain Recovery Unit". Prepared for the New York State Department of Environmental Conservation, Endangered Species Unit. Albany, New York, MOU NUMBER: AM05415

Rosenbaum, P.A. and A.P. Nelson (2005) "Bog Turtle Habitat Assessment in Oswego County New York 1998-2004: Summary Report". Prepared for the United States Fish and Wildlife Service, Cortland, New York.

Rosenbaum, P.A. (2005) "Surveys for Uncommon Dragonflies in Oswego County Wetlands & Trapping for Bog Turtles (*Clemmys = Glyptemys muhlenbergii)* At Sloperville Bog (OR-29) In Oswego County, New York 2005". Prepared for the Nature Conservancy & the New York Natural Heritage Program. Albany, New York. Contract Number NYHER 050430.

Rosenbaum, P.A. and A.P. Nelson.(2006) "Developing & Using a Habitat Model for Bog Turtles for the Lake Plains Prairie Peninsula Recovery Unit (LPPRU): Locating new sites & re-locating historic sites" Summary of Presentation made on February 16, 2006 @ Jug Bay Wetlands Sanctuary Lothian Maryland Workshop on the Conservation of Maryland Bog Turtles.

Rosenbaum, P..A, Nelson, A.P and Breisch, A.R. (2007) "Assessment of Bog Turtles in the Praire Pennisula/Lake Plains Recovery Unit". New York State Biodiversity Research Institute. New York State Museum.

Rosenbaum, P.A. and Nelson, A.P. (2011) "Preliminary Report: Bog turtle surveys to re-evaluate historic sites and identify new sites in Cayuga and Wayne Counties of New York State " U.S. Fish and Wildlife Service.

Recent Research Reports continued

Rosenbaum, P.A. and Nelson, A.P. (2011) Bog turtle surveys to re-evaluate historic sites and identify new sites in Cayuga and Wayne Counties of New York State U.S. Fish

and Wildlife Service.

Selected Scientific and or Invited Presentations

Rosenbaum, P.A. “Strategies for the Conservation of Bog Turtles in New York State" 1994 QUEST presentation at SUNY-Oswego.

Roberts, R.N., Pagano, J.J. and Rosenbaum, P.A.:" Great Lakes Contamination Monitoring Techniques Utilizing the Snapping Turtle” 1994 QUEST presentation at SUNY-Oswego.

Roberts, R.N., Pagano, J.J. and Rosenbaum, P.A.:" Great Lakes Contamination Monitoring Techniques Utilizing the Snapping Turtle" The New York Natural History Conference III April, 1994. Albany, N.Y.

Rosenbaum, P.A. " A Tale of Two Turtle: Headstarting Bog and Spotted Turtles". Columbia University New York, N.Y. Population Biology Seminar. April 7, 1997.

Nelson, A.P and P.A. Rosenbaum (1998) "Floristic Evaluation of Known and Possible Bog Turtle Sites in Central New York ". The New York Natural History Conference V. October, 1998 Albany, N.Y.

Rosenbaum, P.A. "A Tale of Two Turtles: Headstarting Bog and Spotted Turtles". Biology Club. SUNY-Oswego. Spring, 1998.

Rosenbaum, P.A. " A Tale of Two Turtles: Headstarting Bog and Spotted Turtles". 1998 QUEST presentation at SUNY-Oswego.

Rosenbaum, P.A. “Bog and Spotted Turtles" Onondaga Audubon Society. Syracuse, N.Y November 11, 1998.

Rosenbaum, P.A. “Status and Habitat of the Bog Turtle in Western and Central New York State” 5th Annual New York State Wetlands Conference. March 22-23, 1999. Liverpool, New York.

Pagano, J., R. Roberts, P. Rosenbaum, G. Sumner, and L. Williamson. 1999. Utilization of snapping turtle eggs as biomonitors of environmental contamination. In: *Proceedings of the 218th National Meeting American Chemical Society*, New Orleans, LA, USA, Vol. 39, No. 2.

Pagano, J., R. Roberts, P. Rosenbaum, L. Williamson and G. Sumner, 1999. Utilization of snapping turtle eggs as biomonitors of environmental contamination. International Association of Great Lakes Research. Case Western Reserve University, Cleveland, OH, May 25-29, 1999.

Williamson, L., J. Pagano, P. Rosenbaum, and G. Sumner, 1999. Utilization of snapping turtle eggs as biomonitors of environmental contamination. Great Lakes Research Consortium 1999 Student/Faculty Conference. SUNY SF, Syracuse, NY, January 15-16, 1999.

Selected Scientific and or Invited Presentations continued

Nelson, A. P. and Rosenbaum, P.A. “Floristic Comparison of Bog Turtle Sites in Central New York”. Joint Meeting of the ASIH, SSAR, HL, and AES. Pennsylvania State University.

Gabel, S., A.P. Nelson and P.A. Rosenbaum "Great Lakes Environmental Issues: Experiences in a Team Taught, Web Enhanced Course". QUEST 2000 presentation at SUNY-Oswego.

Rosenbaum, P.A. “Status and Habitat of the Bog Turtle in Western and Central New York State” Cornell University Herpetological Society. Ithaca, New York. October 23, 2000.

Rosenbaum, P.A. “Conservation biology of the bog turtle (*Clemmys muhlenbergii)* in New York” Biology Department, Loyola University, New Orleans, LA. March 20, 2001

Rosenbaum, P.A. “Western NY Wild Population Surveys” Bog Turtle Workshop. Seneca Park Zoo. Rochester, New York. July 31, 2001.

Rosenbaum, P.A., J.R. Robertson and Kelly R. Zamudio. “Genetic uniformity among populations of bog turtles (*Clemmys muhlenbergii*): implications for conservation”. Joint meeting of the Society for the Study of Amphibians and Reptiles & the American Society of Ichthyologists and Herpetologists. Kansas City, Mo. July 3-8, 2002.

Rosenbaum, P.A. “Conservation and genetics of the bog turtle (*Clemmys muhlenbergii)*” SUNY-Oswego Sigma Xi Lecture. March, 2003.

Rosenbaum, P.A. “Bog Turtle 101” Bog Turtle Workshop. Sponsored by U.S. Fish & Wildlife Service and Endangered Species Unit of NYS Department of Environmental Conservation. SUNY-Oswego’s Rice Creek Field Station. June 4-5, 2003.

Rosenbaum, P.A. “North America’s Smallest & Rarest Turtle: Conservation, Genetics & Ecology of Bog Turtles {*Clemmys (Glyptemys) muhlenbergii* October 23, 2003. Café Conversations, Penfield Library SUNY-Oswego.

Rosenbaum, P.A. “Ecology, Conservation and Genetics of the Bog Turtle {*Clemmys (Glyptemys) muhlenbergii”.* New York State Department of Environmental Conservation. Albany, New York. April 15, 2004.

Rosenbaum, P.A. Robertson, J.M. & K.R. Zamudio. “Range-wide genetic uniformity among populations of the bog turtle Glyptemys = *Clemmys muhlenbergii.”* The Northeast Natural History Conference VIII May 19-22, 2004

Rosenbaum, P.A. “Ecology, Conservation and Genetics of the Bog Turtle {*Clemmys (Glyptemys) muhlenbergii).”* SUNY-Cortland Biology Club. SUNY-Cortland. October 27, 2004.

Rosenbaum, P.A. “Conservation, Ecology and Genetics of the Bog Turtle {*Clemmys =Glyptemys muhlenbergii}.”* Upstate Herpetological Association. Beaver Lake Nature Center. November 7, 2004.

Selected Scientific and or Invited Presentations continued

Rosenbaum, P.A “Phragmites and Glossy Buckthorn Control Efforts In the Prairie Peninsula Lake Plains Recovery Unit” Bog Turtle Meeting Habitat Management & Survey Crow’s Nest Preserve, Elverson, Pennsylvania, October 24-28, 2005

Rosenbaum, P.A “Bog Turtle Survey Protocol for New York State & Habitat Characteristics In

the Prairie Peninsula Lake Plains Recovery Unit" Bog Turtle Meeting Habitat Management & Survey Crow's Nest Preserve, Elverson, Pennsylvania, October 24-28, 2005

Rosenbaum, P.A "Trapping Studies of Bog Turtles in the Prairie Peninsula Lake Plains Recovery Unit" Bog Turtle Meeting Habitat Management & Survey Crow's Nest Preserve, Elverson, Pennsylvania, October 24-28, 2005

Rosenbaum, P.A "North America's Smallest & Rarest Turtle: Conservation, Genetics & Ecology of Bog Turtles {*Clemmys (Glyptemys) muhlenbergii}*" Waterbury Hall ---SUNY-Oswego, November 30, 2005

Rosenbaum, P.A. "Developing & Using a habitat model for bog turtles for the Lake Plains/Prairie Peninsula Recovery Unit: Locating new sites & re-locating historic sites" Workshop on the Conservation of Maryland Bog Turtles Jug Bay Wetlands Sanctuary; Lothian Maryland, February 16-17, 2006

Rosenbaum, P.A. "Trapping Studies of Bog Turtles In the Prairie Peninsula Lake Plains Recovery Unit Workshop on the Conservation of Maryland Bog Turtles" Jug Bay Wetlands Sanctuary; Lothian Maryland, February 16-17, 2006

Rosenbaum, P.A. "Conservations implications of range-wide genetic uniformity among populations of the bog turtle *Glyptemys = (Clemmys) muhlenbergii".* Wildlife Genetics Issues for Management Brookhaven National Laboratory; Upton, New York March 28-30, 2006

Rosenbaum, P.A & A.P. Nelson "Finding Wright's Westbury" Northeast Natural History Conference IX; New York State Museum; Albany, New York; April 20-21, 2006

Rosenbaum, P.A "*Bog Turtle Habitat Characteristics, Site Protection & Site Stewardship Activities in the Lake Plains-Prairie Peninsula Recovery Unit"* NYS Wetlands Forum 2006 Conference. Marx Hotel and Conference Center. Syracuse, New York April 19, 2006

Rosenbaum, P.A & A.P. Nelson "Finding Wright's Westbury" Joint meeting of the Society for the Study of Amphibians and Reptiles & the American Society of Ichthyologists and Herpetologists. New Orleans, LA. July 12-17, 2006.

Rosenbaum, P.A. J.R. Robertson and K.R. Zamudio. *"Unexpectedly* low genetic variation among populations of the bog turtle" (*Glyptemys muhlenbergii*)". Keynote Address. Fourth Annual Meeting of Bog Turtle Surveyors and Poconos Environmental Education Center. Regulatory Agencies. Milford, PA. February 21. 2007

Rosenbaum, P.A and A.P Nelson. Bog Turtle Habitat Characteristics and Stewardship Issues in the New York State Portion of the Prairie Peninsula - Lake Plains Recovery Unit. Bog Turtle Recovery Meeting. Langhorne, PA. November 17, 2011

Recent Funded Research Grants

1990 SUNY-Oswego Faculty Development Grant. "Field Survey of Bog Turtles in Oswego County".

1998 SUNY-Oswego Scholarly & Creative Activities Committee. "Establishing a Database of Oswego County Bogs" To Damon B. Oscarson (Peter A. Rosenbaum & Andrew P. Nelson, Sponsors).

1998 U.S. Fish and Wildlife Service. "Bog Turtle Habitat Assessment in Central New York.

Year 1" To Peter A. Rosenbaum and Andrew P. Nelson.

1999 U.S. Fish and Wildlife Service. "Bog Turtle Habitat Assessment in Central New York. Year 2" To Peter A. Rosenbaum and Andrew P. Nelson.

1999 SUNY-Oswego Scholarly & Creative Activities Committee. “Implementing Great Lakes Environmental Issues. Biology/ Earth Sciences 363”. To Peter A. Rosenbaum, Sharon Gabel, Andrew Nelson and James Pagano.

2000 U.S. Fish and Wildlife Service “Bog Turtle Habitat Assessment in Oswego County New York --Year 3". To Peter A. Rosenbaum and Andrew P. Nelson.

2000 U.S. Fish and Wildlife Service “Trapping to Verify Bog Turtle Populations at Selected Sites in Oswego County". To Peter A. Rosenbaum and Andrew P. Nelson.

2000 SUNY-Oswego Scholarly & Creative Activities Committee. “Trapping to Verify Bog Turtle Populations at Selected Sites in Oswego County”. To Peter A. Rosenbaum.

2001 SUNY-Oswego Scholarly & Creative Activities Committee. "Field Survey of Reptiles and Amphibians at Bergdorf’s Bog, Eastern Wayne County, New York” To Roy C. Fillingham (Peter A. Rosenbaum, Sponsors).

2002 Chelonian Research Foundation. “Genetic Variation in the Bog Turtle. To Peter A. Rosenbaum and Kelly R. Zamudio.

2003-2006 U.S. Fish and Wildlife Service “Control and Monitoring of the Invasive Plant Species Glossy Buckthorn (*Rhamnus frangula*) at a Hub of Regional Biodiversity in Western New York State. To Peter A. Rosenbaum (PI), Andrew P. Nelson & Sandra Bonanno.

2003-*2006* U.S. Fish and Wildlife Service “Control of the Invasive Common Reed (*Phragmites australis*) at a Unique Calcareous Fen in Western New York State”. To Peter A Rosenbaum (PI), Andrew P. Nelson & Sandra Bonanno.

2003-2004 U.S. Fish and Wildlife Service " Bog Turtle Habitat Assessment in Oswego County New York--Years 4-5 (2003-04) To Peter A Rosenbaum (PI) & Andrew P. Nelson.

2004-2005- New York State Department of Environmental Conservation. Memorandum of Understanding (MOU) to conduct “Bog Turtle Surveys at Selected Sites in the Prairie Peninsula Lake Plains Recovery Zone.

Recent Funded Research Grants continued

2004-2005 Contract: New York State Natural Heritage Program/The Nature Conservancy. Survey for Bog Turtles (*Clemmys = Glyptemys muhlenbergii)* At Sloperville Bog (OR-29) In Oswego County, New York, 2004 Contract # NYHER 040429.

2005-06 Contract: New York State Natural Heritage Program/The Nature Conservancy. Contract # NYHER 050430. Bog Turtle and Dragonfly Surveys in Oswego County Fen to Peter A. Rosenbaum via the SUNY Research Foundation.

2005-07: United State Fish and Wildlife Service (USFWS) “Bog Turtle Habitat Assessment in Cayuga & Wayne Counties, New York. Year 1” to Peter A. Rosenbaum (P.I.).

2006-07 Scholarly and Creative Activities Committee (SCAC) of SUNY-Oswego to Kyle Pursel, undergraduate student working under my direction for his project on “Life History, Habitats and Seasonal Movements of Wood Turtles (*Clemmys = Glyptemys insculpta*) in Central New York”

2010-2011. United States Fish and Wildlife Service. “Bog turtle surveys to re-evaluate historic sites and identify new sites in Cayuga and Wayne Counties of New York State “U.S. Fish and Wildlife Service.

Selected Workshops Organized and/or Hosted.

“Bog Turtle Workshop”. Sponsored by U.S. Fish & Wildlife Service and Endangered Species Unit of NYS Department of Environmental Conservation. SUNY-Oswego’s Rice Creek Field Station. June 4-5, 2003.Organized, hosted, presented talk & lead fieldtrip.

“Bog Turtle Workshop”. Sponsored by U.S. Army Corp of Engineers and U.S. Fish and Wildlife Service. September 22-23, 2009. Organized, hosted, presented talk & lead fieldtrip.

Revised December 2011